



MONTGOMERY WATSON

November 19, 1999

US EPA RECORDS CENTER REGION 5



466185

Mr. Kevin Adler
Remedial Project Manager
U.S. Environmental Protection Agency
Region V, SR-6J
77 West Jackson Boulevard
Chicago, IL 60604-3590

Re: GWTP Second Quarter 1999 Report
Groundwater Monitoring Report – June 1999
ACS NPL Site

Dear Mr. Adler:

Please find enclosed two copies of the Groundwater Treatment System, Quarterly Monitoring Report, Second Quarter 1999 for the American Chemical Service NPL Site in Griffith, Indiana. This report is submitted in accordance with the PGCS Performance Standard Verification Plan, April 1997.

Also included, please find two copies of the Groundwater Monitoring Report for June 1999. In accordance with the ACS Groundwater Monitoring Plan, the sampling activities included collecting water levels at the network level-measuring stations, collecting samples for contaminant analysis from upper and lower aquifer monitoring wells, and collecting natural attenuation parameters from upper aquifer monitoring wells

We are also sending two copies of each report to IDEM and two copies of each report to Black & Veatch Waste Systems. If you need additional copies of either report please let me know and we can forward them to you, or whomever you specify.

Sincerely,

Peter J. Vagt, Ph.D., CPG
Project Manager

cc: S. Grady (2 copies of each report)
S. Mrkvicka, B&V (2 copies of each report)
ACS Technical Committee (1 copy of each report to each member)

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GROUNDWATER TREATMENT SYSTEM
QUARTERLY MONITORING REPORT
SECOND QUARTER 1999

AMERICAN CHEMICAL SERVICE NPL SITE
GRIFFITH, INDIANA

Montgomery Watson File No. 1252057

Prepared For:

American Chemical Service NPL Site RD/RA Executive Committee
Griffith, Indiana

Prepared By:

Montgomery Watson
27755 Diehl Road, Suite 300
Warrenville, Illinois 60555

November 1999



MONTGOMERY WATSON


GROUNDWATER TREATMENT SYSTEM
QUARTERLY MONITORING REPORT
SECOND QUARTER 1999

AMERICAN CHEMICAL SERVICE NPL SITE
GRIFFITH, INDIANA

Prepared For:


American Chemical Service NPL Site RD/RA Executive Committee
Griffith, Indiana

Prepared by:


Robert A. Adams, EIT
Project Engineer

NOVEMBER 16, 1999
Date

Approved by:


Thomas A. Blair, P.E.
Project Manager

11/16/99
Date

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1.0 INTRODUCTION

Montgomery Watson, on behalf of the ACS RD/RA Executive Committee, commenced operation of an on-site groundwater treatment system at the American Chemical Service NPL Site (ACS Site) in Griffith, Indiana on March 13, 1997. The system was designed to treat groundwater from the perimeter groundwater containment system (PGCS) and certain volumes of water from the Barrier Wall Extraction System (BWES). The treatment consists of a phase separator for oil and free product removal, equalization tanks, a UV-oxidation unit for destruction of organic constituents, an air stripper to remove methylene chloride and other organics, a chemical precipitation and clarification unit to remove metals, a sand filter to remove suspended solids, and activated carbon vessels for final polishing of the treated groundwater. The treated effluent from the treatment system is discharged to the nearby wetlands, west of the treatment system, in accordance with Agency approvals.

The 22,000-gallon storage tank (fract tank) used during the full-scale pilot study conducted at the treatment plant from the end of July to the middle of November 1998 continued to be used for additional volatile organic compound (VOC) reduction during this reporting period. The rest of the components from the full-scale pilot study were removed in November 1998. The results of the full-scale pilot study were used to design upgrades to the existing groundwater treatment plant. The upgraded groundwater treatment plant will be capable of handling the anticipated higher levels of organic contamination present in the BWES groundwater. These upgrades, currently under construction, will include phase-separation of free-organic product and oil and grease, aerated equalization of collected groundwater, and activated sludge treatment to reduce the biological oxygen demand (BOD₅) and chemical oxygen demand (COD) in the collected groundwater.

This groundwater effluent monitoring report summarizes effluent analytical data and water level gauging data collected between April 1999 and June 1999.

2.0 COMPLIANCE MONITORING

2.1 INTRODUCTION

Effluent samples were periodically collected from the treatment system to demonstrate compliance with the discharge limits (Table 2.1) established by Indiana Department of Environmental Management (IDEM) and United States Environmental Protection Agency (U.S. EPA). To be conservative, sampling frequency for the effluent samples is currently in exceedence of the requirements contained in the Agency-approved Performance Standard Verification Plan (PSVP) and presented in Table 2.2. During the previous reporting period, the effluent compliance samples were collected on a monthly basis. The samples will continue to be collected on a monthly basis until the treatment system is operating in a relatively steady state after completion and startup of the groundwater treatment plant upgrades.

Sampling and analyses were performed in accordance with the Agency-approved PSVP Quality Assurance Project Plan (QAPP) prepared by Montgomery Watson for the ACS RD/RA Executive Committee in April 1997. The following paragraphs present details on sampling and analyses, and also summarize the analytical data for the treatment system effluent.

2.2 SAMPLING AND ANALYSES

Effluent samples are collected on a monthly basis. For this reporting period, the samples were collected on the following days:

Monitoring Period	Sample Date
Month 23	4/20/99
Month 24	5/24/99
Month 25	6/29/99

Effluent samples were collected directly from a sample tap on the effluent line just before it exits the groundwater treatment system building. All effluent samples were placed in contaminant-free containers, as specified in the U.S. EPA Specifications and Guidance for Obtaining Contaminant-Free Sample Containers (U.S. EPA, 1992). Appropriate sample containers and preservatives, as specified in the QAPP, were used to collect and preserve the samples. Following sample collection, the sample containers were refrigerated at 4° C in coolers. Chain-of-Custody forms were prepared to track the transfer of samples from the treatment system to the laboratories. In accordance with the approved QAPP, samples were analyzed by the following analytical methods:

<u>Parameter</u>	<u>Analytical Method</u>
VOCs	SW-846 8260B
SVOCs	SW-846 8270C
Pentachlorophenol	SW-846 8270C and SIM
Pesticides/PCBs	EPA 608
Metals (Excluding Mercury)	SW-846 6010
General Water Quality Parameters (TSS and BOD-5)	EPA 160.2 and 405.1
Mercury	SW-846 7470
pH	EPA 150.1

2.3 ANALYTICAL RESULTS

In general, the system effluent was compliant with the discharge limits presented in Table 2.1. There were not any total suspended solids (TSS), or semi-volatile organic compounds (SVOCs) exceedences in the system effluent during the period between April 20, 1999 and June 29, 1999. However, during this monitoring period, there was one arsenic exceedence (result was 0.09 mg/L, limit is 0.05 mg/L), one pH exceedence (result was 9.5 S.U., limit is 6-9 S.U.), one benzene exceedence (result was 370 µg/L, limit is 5 µg/L), one methylene chloride exceedence (result was estimated at 8.5 µg/L, limit is 5 µg/L. Note: methylene chloride result was below the laboratory reporting limit for this sample event and was estimated), and one BOD₅ exceedence (result was 92 mg/L, limit is 30 mg/L). The U.S. EPA was notified upon receipt of the analytical data for each compliance sample of each of these apparent exceedences and the corrective measures taken to mitigate them. A comparison of the analytical data collected during the monitoring period with the discharge limits is presented in Table 2.3. Detailed analytical reports are attached in Appendix A.

Following is a narrative of the discharge exceedences that the treatment system experienced during the period of April 20, 1999 through June 29, 1999.

April 20, 1999 Compliance Sample

An arsenic concentration of 0.09 mg/L was recorded for the sample collected on April 20, 1999, above the effluent limit of 0.05 mg/L. A pH exceedence was also observed during this sampling event exceedence (result was 9.5 S.U., limit is 6-9 S.U.) U.S. EPA was immediately informed of the exceedence and investigations into the possible causes of the exceedences in a letter dated June 8, 1999.

A similar arsenic exceedence was also observed in a previous compliance sample collected on October 28, 1998. At that time an investigation of the influent to the groundwater treatment plant was conducted. The investigation indicated that the influent concentrations of arsenic were below the detection limit. The activated carbon was also investigated. Carbonair, the supplier of the activated carbon, informed Montgomery Watson that the activated carbon did not contain arsenic. After the April 20, 1999 exceedence, Montgomery Watson interviewed Carbonair again regarding the arsenic content of the activated carbon. During this second interview, Carbonair acknowledged that the activated

carbon supplied to the ACS Site does potentially contain heavy metals because it is made from a bituminous coal with a natural heavy metal content and that the metals and arsenic could potentially leach in to the effluent stream of recently changed vessels (for approximately 1 or 2 days). This leaching may also result in short-term pH spikes (pH>9 S.U.). Carbonair has provided Montgomery Watson a letter from Envirotrol, the virgin carbon supplier, confirming the natural heavy metal content of the carbon.

Montgomery Watson will schedule future compliance sampling and activated carbon change-outs so that the sampling is representative of the treatment plant effluent and readjust the effluent pH control system for a target effluent pH of 7.0 S.U. instead of 7.5 S.U. to counteract the elevated pH levels from the newly changed carbon.

May 24, 1999 Compliance Sample

A benzene concentration of 370 µg/L and a methylene chloride concentration of 8.5 µg/L were recorded for the sample collected on May 24, 1999, above the effluent limits of 5 µg/L and 5 µg/L, respectively. U.S. EPA was immediately informed of the exceedences in a letter dated July 23, 1999.

Montgomery Watson feels that the existing treatment system has the appropriate treatment processes (aeration tank, air stripper, and activated carbon cells) to remove benzene and methylene chloride sufficiently. These units were operating properly during the May 24, 1999 sampling event, and therefore, we feel the analytical lab results are not indicative of actual effluent. Also, no benzene or methylene chloride (or other VOC) exceedences were observed in the subsequent (June, July, or August 1999) compliance sample results. Therefore, we believe that these exceedences may have been caused by ambient contaminants near the sampling point, sample container, or laboratory contamination and are not representative of the GWTP effluent.

June 29, 1999 Compliance Sampling

A BOD₅ concentration of 92 mg/L was recorded for the sample collected on June 29, 1999, exceeding the effluent limit of 30 mg/L. U.S. EPA was immediately informed of the exceedence in a letter dated August 6, 1999. The following investigations were conducted to determine the reasons for the exceedence.

In addition to the effluent compliance sample, a GWTP influent sample was collected and analyzed for BOD₅ during the August compliance sampling event. The influent BOD₅ concentration was 8.8 mg/L and the BOD₅ was "non-detect" in the effluent. These sample results and the effluent compliance samples from the previous months indicate that the typical BOD₅ concentrations in the GWTP effluent are significantly lower than the 92 mg/L observed during the June compliance sampling event. However, due to the known variable influent characteristics and the other unexplained random exceedences (discussed in this section), the interior 10,000-pound GAC units were visually inspected during the carbon change-out on August 17, 1999. The inspection indicated that the interior of both units was corroded. The corrosion might have allowed "short-circuiting" through the units. These units were repaired.

2.4 GENERAL CORRECTIVE MEASURES

Based on the number of exceedences and apparent external causes, we have the following implemented corrective actions for our compliance sampling program:

- 1) The interior 10,000-lb activated carbon cells were inspected and repaired in August 1999.
- 2) A compliance sampling procedure flow chart was developed to document the sample collection, analysis and validation procedure. This chart will assist in tracking the sample through the process and provides a decision path to eliminate potential problems and correct occurring problems. A copy of this flow chart is included in Appendix B.
- 3) The existing GWTP will be upgraded to more efficiently treat the current and expected future influent mixture. A summary of the upgrades is included in Section 3.0.

3.0 TREATMENT SYSTEM PROCESS MODIFICATIONS

There were no long term operational problems with the groundwater treatment plant during this quarter. There were not any significant modifications to the treatment system. The only change from historic operating conditions was the continued use of the equalization/aeration tank from the full-scale activated sludge pilot study. The system has been operating in the current configuration with the equalization/aeration tank since November 1998. This configuration was discussed in the quarterly monitoring report for the First Quarter 1999.

The following work items are scheduled:

- An inspection of the interior of the 10,000-lb activated carbon cells was scheduled for August 1999. The results of the inspection and subsequent repairs will be included in the third quarter 1999 report.
- Construction of the GWTP upgrades is scheduled to begin in Fall 1999. The work will include:
 - a) Procurement of equipment
 - b) Subgrade and concrete work for the gravity phase-separator tank and building expansion foundation
 - c) Erection of the activated sludge plant
 - d) Erection of the gravity-phase separator
 - e) Erection of the treatment plant building expansion
 - f) Installation of the catalytic oxidizer-scrubber unit
 - g) Installation of the process pumps and piping
 - h) Installation of the electrical and control lines and associated upgrades
 - i) Upgrade the programmable logic control center
 - j) Start-of the upgraded system after completion of the upgrades

4.0 PGCS AND BWES GAUGING ACTIVITIES

The PGCS trench groundwater extraction wells were operated in "auto" mode continuously throughout this monitoring period. In "auto" mode, each of the PGCS extraction wells are set to turn on or off automatically based on water levels within tank T-2. This mode is used to control the flowrate through the treatment system. In accordance with the PSVP for the Site, a discussion on the effect of the PGCS and BWES on the water table near the Site is presented in each quarterly monitoring report. This section presents a discussion on the groundwater elevation findings during the months of April through June 1999. Groundwater elevation measurements were collected throughout the Site on June 7, 1999. However, to keep track of the groundwater table inside the barrier wall, levels were collected from the BWES piezometers (P-3, P-32, P-49 and P-96) on a weekly basis. The levels from these four piezometers are shown in the table below.

	Water Table Elevation			
Date	P-3	P-32	P-49	P-96
April 9, 1999	634.47	635.02	634.08	630.59
April 16, 1999	634.27	634.92	634.08	630.79
April 23, 1999	635.57	636.62	635.38	634.69
April 27, 1999	635.47	635.92	635.78	632.59
April 30, 1999	635.57	636.02	635.88	632.39
May 7, 1999	635.37	635.82	635.68	631.69
May 14, 1999	635.07	635.62	634.68	630.89
May 21, 1999	635.07	635.32	635.18	634.19
May 28, 1999	635.17	635.32	634.98	630.69
June 4, 1999	635.47	635.82	635.48	632.59
June 11, 1999	635.47	635.57	635.28	633.24
June 18, 1999	635.47	635.32	635.08	633.89
June 25, 1999	635.27	635.52	635.18	632.79

These levels indicate that during the reporting period, the water table inside the barrier wall has been maintained at a fairly constant level (approximately 635 to 636) by continued operation of the BWES. These levels have been maintained to minimize the amount of BWES groundwater that needs to be treated and maintain the water table at a low enough level to prevent overtopping of the barrier wall. The water elevations inside the barrier wall are depicted graphically on Figure 4.1. P-96 is in close proximity to BWES extraction trench EW-11, and therefore fluctuates with the operation of the pump in EW-11.

The influence of the PGCS trench on groundwater flow patterns is illustrated by Figure 4.2 (June 1999). The direction of groundwater flow was from east to west during these months. These figures indicate an inward gradient toward the PGCS.

The barrier wall was constructed to isolate a highly contaminated zone and the BWES was installed to collect the contaminated water within the barrier wall. A series of 16 piezometers was installed in eight pairs, one piezometer of each pair on either side of the barrier wall at each of the BWES trench locations, to allow measurement and tracking of water level measurements. In order to ensure that the barrier wall was serving its designed function, groundwater elevations in these piezometers both inside and outside the barrier wall are monitored.

Groundwater elevations inside and outside the barrier wall were monitored on June 7, 1999. Figure 4.3 illustrates these groundwater elevations. Fluctuations in the gradient across the barrier wall occur due to seasonal groundwater conditions, pumping rates from the BWES, and infiltration through the Site covers. However, the groundwater elevations measured in the piezometers indicated that the elevations inside the barrier wall were all greater than six inches higher than those outside the barrier wall. These data demonstrate that the barrier wall is successfully performing the intended function of isolating and containing the groundwater from the known source areas of the Site inside the barrier wall. Water levels from the piezometers on June 7, 1999 are presented below:

Piezometer	Location ⁽¹⁾	Water Level	Difference ⁽²⁾
P-93	Outside	632.14	3.01
P-49 ³	Inside	635.15	
P-95	Outside	631.19	0.92
P-96	Inside	632.11	
P-97	Outside	631.71	0.66
P-98	Inside	632.37	
P-99	Outside	633.65	1.19
P-100	Inside	634.84	
P-101	Outside	634.76	0.62
P-102	Inside	635.38	
P-103	Outside	634.67	0.90
P-104	Inside	635.57	
P-105	Outside	NM ⁽⁴⁾	NA
P-106	Inside	NM ⁽⁴⁾	
P-107	Outside	633.81	1.32
P-108	Inside	635.13	

Notes:

1. Location refers inside or outside the barrier wall.
 2. A positive value indicates that the water level is higher within the barrier wall. A negative value would indicate that the water level is lower within the barrier wall.
 3. Piezometer P-94 was damaged and could not be measured this monitoring period. Therefore the groundwater level from piezometer P-49 was used to calculate the hydraulic gradient. Piezometer P-94 will be repaired.
 4. Piezometers P-105 and P-106 were buried with gravel during road grading activities performed by the ACS facility and could not be measured this monitoring period. However, these piezometers have been uncovered and will be used in future reports.
- NA Value could not be calculated from single measurement.

It is not the intent to continuously operate with the higher groundwater levels inside the barrier wall. The groundwater levels within the barrier wall during this monitoring period were balanced to maintain a safe level that would not over flow the barrier wall while minimizing the amount of groundwater within the barrier wall that requires collection and treatment resulting in excessive GAC usage. Upon completion of the groundwater treatment plant upgrades, the groundwater pumping rate of the BWES will be increased to lower the water table for implementation of the in-situ soil vapor extraction systems to be installed in accordance with the Final Remedy.

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Table 2.1
Groundwater Treatment System Effluent Discharge Limits
American Chemical Service NPL Site
Griffith, Indiana

Groundwater Quality Parameter	Effluent Standard (Limit)
<i>General Water Quality Parameters</i>	
PH	6 - 9 S.U.
BOD-5	30 mg/L
TSS	30 mg/L
<i>Inorganics</i>	
Arsenic	50 µg/L
Beryllium	NE
Cadmium	4.1 µg/L
Manganese	NE
Mercury	0.02 µg/L (w/DL = 0.64)
Selenium	8.2 µg/L
Thallium	NE
Zinc	411 µg/L
<i>Volatile Organics</i>	
Acetone	6,800 µg/L
Benzene	5 µg/L
2-Butanone	210 µg/L
Chloromethane	NE
1,4 - Dichlorobenzene	NE
1,1 - Dichloroethane	NE
1,2 - Dichloroethene - cis	70 µg/L
Ethylbenzene	34 µg/L
Methylene chloride	5 µg/L
Tetrachloroethene	5 µg/L
Trichloroethene	5 µg/L
Vinyl chloride	2 µg/L
4 - Methyl - 2 - pentanone	15 µg/L
<i>Semi-Volatile Organics</i>	
bis(2 - Chloroethyl) ether	9.6 µg/L
bis(2 - Ethylhexyl) phthalate	6 µg/L
Isophorone	50 µg/L
4 - Methylphenol	34 µg/L
Pentachlorophenol	1 µg/L
<i>PCBs</i>	
PCBs	0.00056 µg/L (w/DL = 0.1)

NE = No effluent limit established.

DL = Detection limit

Table 2.2
Sampling Frequency Scheme
Groundwater Treatment System
American Chemical Service NPL Site
Griffith, Indiana

Analytes	Cumulative Time From Startup¹	Frequency³
Flowrate and pH	–	Continuous
BOD, TSS, SVOCs and Metals	0 to 7 days	Once per day
	8 to 30 days	Once per week
	31 to 180 days	Once per month
	181 days onward ²	Once per quarter
VOCs	0 to 7 days	Once per day
	8 to 30 days	Once per week
	31 days onward ²	Once per month
PCBs	0 to 7 days	Once
	8 to 30 days	Once
	31 to 180 days	Twice
	181 days onward ²	Once per quarter
PCBs in Sediment (one location)	–	Once per year

Notes

1. Cumulative time from startup of the groundwater treatment system. Startup refers to the point at which contaminated groundwater from the extraction trench was being introduced into the treatment system. Startup occurred once the initial equipment/system testing with clean water was completed (March 13, 1997).
2. The monitoring period covered in this report is within this cumulative time division.
3. Due to the exceedences observed in the current and previous reporting period, compliance samples are currently being collected on a monthly basis.

Table 2.3
Summary of Compliance Monitoring Data
Second Quarter 1999
American Chemical Service NPL Site
Griffith, Indiana

Event	Month 23	Month 24	Month 25	
Date	4/20/99	5/24/99	6/29/99	Effluent Limits
pH	9.5	7	7.2	6-9
TSS	ND	ND	9	30
BOD	20	3.2	92	30
Arsenic	0.09	0.0055 B	ND	0.05
Beryllium	ND	ND	ND	NE
Cadmium	ND	ND	ND	0.0041
Manganese	0.0081 B	0.3	0.121	NE
Mercury	0.00017 B	ND	ND	0.00002
Selenium	0.0034 B	ND	ND	0.0082
Thallium	ND	0.0032 B	ND	NE
Zinc	0.017 B	0.0066 B	0.0153 B	0.411
Benzene	ND	370	0.3 J	5
Acetone	16 J	72 B	7 B	6,800.0
2-Butanone	ND	ND	1 J	210
Chloromethane	ND	ND	ND	NE
1,4-Dichlorobenzene	ND	ND	ND	NE
1,1-Dichloroethane	ND	ND	ND	NE
cis-1,2-Dichloroethene	ND	4.4 J	ND	70
Ethylbenzene	ND	ND	ND	34
Methylene chloride	ND	8.5 J	ND	5
Tetrachloroethene	ND	ND	ND	5
Trichloroethene	ND	ND	ND	5
Vinyl chloride	ND	ND	ND	2
4-Methyl-2-pentanone	ND	ND	ND	15
bis (2-Chloroethyl) ether	ND	ND	ND	9.6
bis(2-Ethylhexyl) - phthalate	ND	ND	ND	6
4 - Methylphenol	ND	ND	ND	34
Isophorone	ND	ND	ND	50
Pentachlorophenol	ND	ND	0.29	1
PCBS	NS	NS	ND	0.00056

Notes:

Shaded cells indicate discharge exceedances

pH data is expressed in S.U.

TSS, BOD-5 and Metals data is expressed in mg/L

VOC, SVOC and PCB data is expressed in µg/L

Suffix Definitions:

B = Compound is also detected in the blank

BQL = Below quantitation limit

J = Result is detected below the reporting limit and is an estimated concentration

ND = Not detected

NE = No effluent limit established.

NS = Not required to be sampled.



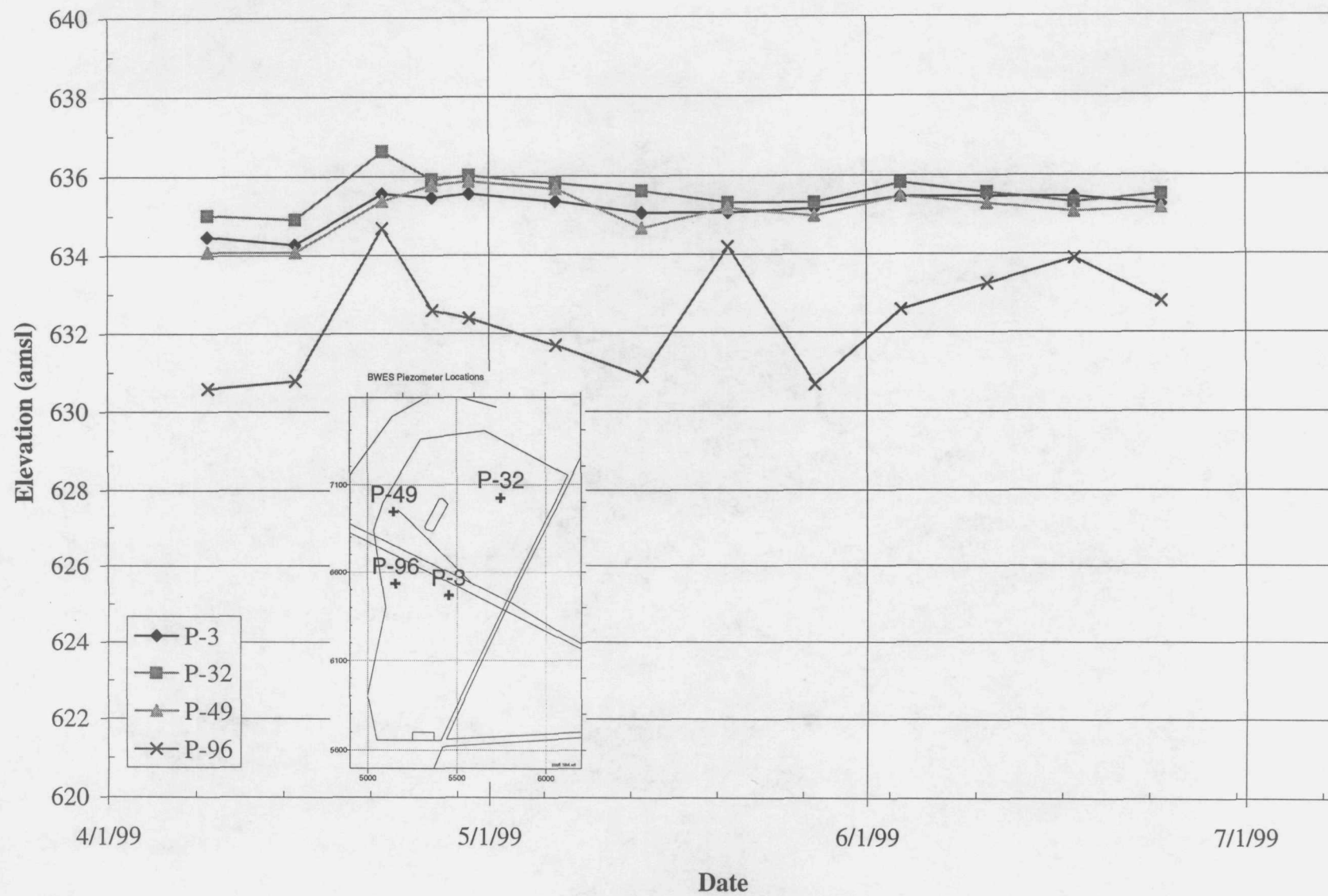
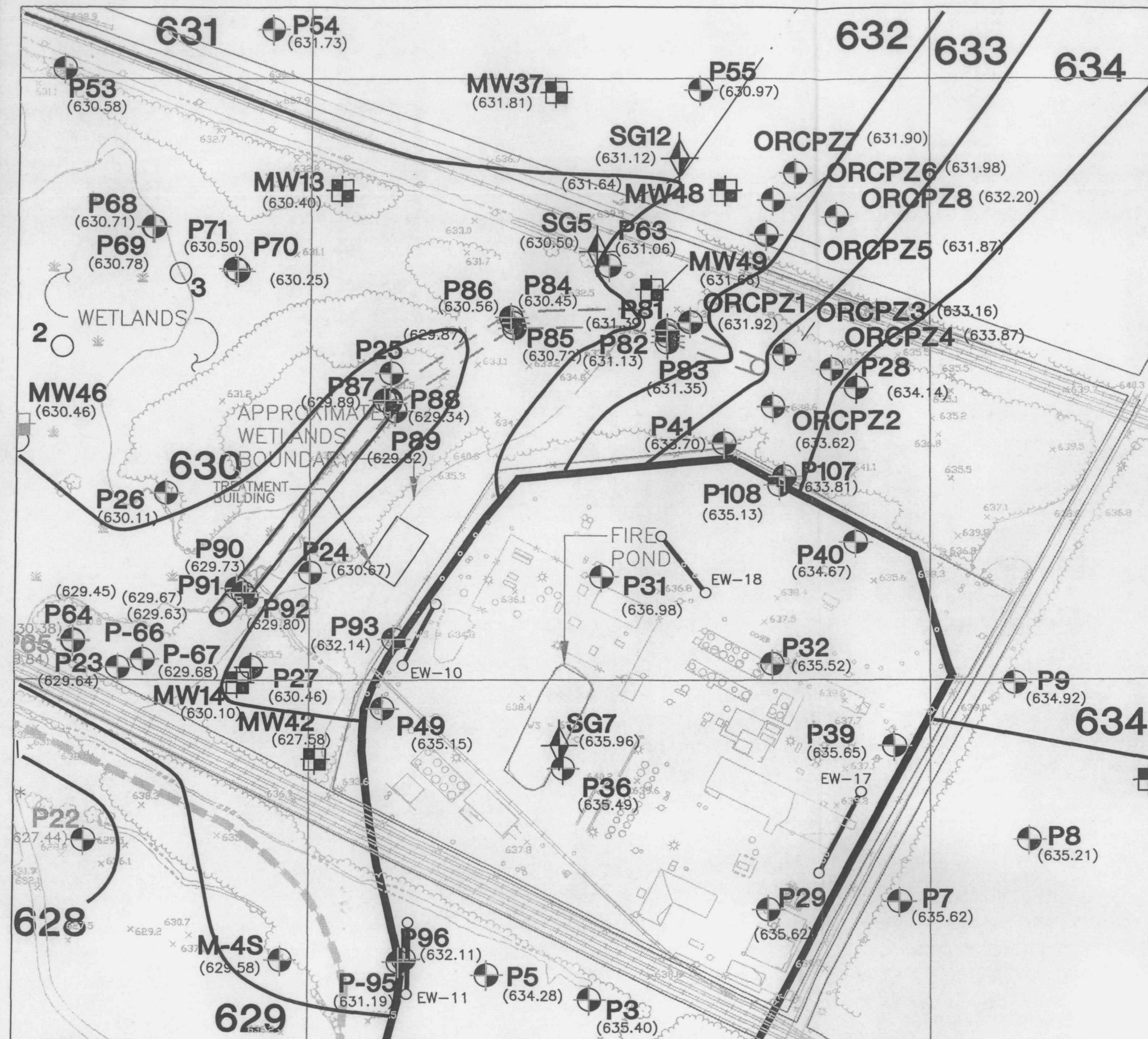


FIGURE 4.1
WATER LEVELS INSIDE BARRIER WALL



LEGEND

- P106 PIEZOMETER LOCATION AND DESIGNATION
- ORCPZ7 ORC PIEZOMETER LOCATION AND DESIGNATION
- MW48 MONITORING WELL LOCATION AND DESIGNATION
- SG12 STAFF GAUGE LOCATION AND DESIGNATION
- (DRY) WELL/STAFF GAUGE WAS DRY DURING MEASURING
- (631.56) GROUNDWATER ELEVATION
- BARRIER WALL
- GRIFFITH LANDFILL BOUNDARY
- PERIMETER GROUND WATER CONTAINMENT SYSTEM EXTRACTION TRENCH
- EW-11 BWES EXTRACTION TRENCH LOCATION AND DESIGNATION
- 630 GROUNDWATER ELEVATION CONTOUR BASED ON GROUNDWATER ELEVATION DATA

NOTE

1. GROUNDWATER ELEVATIONS WERE MEASURED AT THE SITE ON JUNE 7, 1999



FIGURE 4.2

Developed By	RAA	Drawn By	RC
Approved By	TAB	Date	9/3/99
Reference	J:\1252\051\271801\2nd QTR\PGCS_0699_June_2.dwg		
Revisions			

ACS GROUNDWATER TREATMENT SYSTEM
 QUARTERLY MONITORING REPORT-2nd QTR, 1999
 PGCS GAUGING
 JUNE 1999

Drawing Number
 1252042

MONTGOMERY WATSON



A



MONTGOMERY WATSON ANAL. TEST & CONS.

Client Sample ID: EFFLUENT

GC/MS Volatiles

Lot-Sample #....: G9D210227-001 Work Order #....: CTW4P101 Matrix.....: WATER
 Date Sampled....: 04/20/99 14:00 Date Received...: 04/21/99 09:55
 Prep Date.....: 04/28/99 Analysis Date...: 04/28/99
 Prep Batch #....: 9119254 Analysis Time...: 19:30
 Dilution Factor: 1

Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Dichlorodifluoromethane (Freon 12)	ND	1.0	ug/L WJ
Trichlorofluoromethane (Freon 11)	ND	1.0	ug/L WJ
Chloromethane	ND	1.0	ug/L
Vinyl chloride	ND	1.0	ug/L
Bromomethane	ND	1.0	ug/L
Chloroethane	ND	1.0	ug/L
1,1-Dichloroethene	ND	1.0	ug/L
Methylene chloride	ND	1.0	ug/L
trans-1,2-Dichloroethene	ND	1.0	ug/L
1,1-Dichloroethane	ND	1.0	ug/L
2,2-Dichloropropane	ND	1.0	ug/L
Bromochloromethane	ND	1.0	ug/L
Chloroform	ND	1.0	ug/L
1,1,1-Trichloroethane	ND	1.0	ug/L
Carbon tetrachloride	ND	1.0	ug/L
1,1-Dichloropropene	ND	1.0	ug/L
Benzene	ND	1.0	ug/L
1,2-Dichloroethane	ND	1.0	ug/L
Trichloroethene	ND	1.0	ug/L
1,2-Dichloropropane	ND	1.0	ug/L
Dibromomethane	ND	1.0	ug/L
Bromodichloromethane	ND	1.0	ug/L
Toluene	ND	1.0	ug/L
1,1,2-Trichloroethane	ND	1.0	ug/L
Tetrachloroethene	ND	1.0	ug/L
1,3-Dichloropropane	ND	1.0	ug/L
Dibromochloromethane	ND	1.0	ug/L
1,2-Dibromoethane (EDB)	ND	2.0	ug/L
Chlorobenzene	ND	1.0	ug/L
1,1,1,2-Tetrachloroethane	ND	1.0	ug/L
Ethylbenzene	ND	1.0	ug/L
m-Xylene & p-Xylene	ND	1.0	ug/L
o-Xylene	ND	1.0	ug/L
Styrene	ND	1.0	ug/L
Bromoform	ND	1.0	ug/L
Isopropylbenzene	ND	1.0	ug/L

6/2/99


(Continued on next page)

MONTGOMERY WATSON ANAL. TEST & CONS.

Client Sample ID: EFFLUENT

GC/MS Volatiles

Lot-Sample #....: G9D210227-001 Work Order #....: CTW4P101 Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Bromobenzene	ND	1.0	ug/L
1,1,2,2-Tetrachloroethane	ND	1.0	ug/L
1,2,3-Trichloropropane	ND	1.0	ug/L
n-Propylbenzene	ND	1.0	ug/L
2-Chlorotoluene	ND	1.0	ug/L
1,3,5-Trimethylbenzene	ND	1.0	ug/L
1,2,4-Trimethylbenzene	ND	1.0	ug/L
sec-Butylbenzene	ND	1.0	ug/L
1,3-Dichlorobenzene	ND	1.0	ug/L
p-Isopropyltoluene	ND	1.0	ug/L
1,4-Dichlorobenzene	ND	1.0	ug/L
1,2-Dichlorobenzene	ND	1.0	ug/L
n-Butylbenzene	ND	1.0	ug/L
1,2-Dibromo-3-chloropropane (DBCP)	ND	2.0	ug/L
1,2,4-Trichlorobenzene	ND	1.0	ug/L
Hexachlorobutadiene	ND	1.0	ug/L
Naphthalene	ND	1.0	ug/L
1,2,3-Trichlorobenzene	ND	1.0	ug/L
cis-1,2-Dichloroethene	ND	1.0	ug/L
Acetone	16	2.0	ug/L J
2-Butanone (MEK)	ND	2.0	ug/L
4-Methyl-2-pentanone (MIBK)	ND	2.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
1,2-Dichloroethane-d4	106	(70 - 130)
4-Bromofluorobenzene	93	(70 - 130)
Toluene-d8	94	(70 - 130)

6/2/09
JW



MONTGOMERY WATSON ANAL. TEST & CONS.

Client Sample ID: EFFLUENT

GC/MS Semivolatiles

Lot-Sample #....: G9D210227-001 Work Order #....: CTW4P102 Matrix.....: WATER
Date Sampled....: 04/20/99 Date Received...: 04/21/99
Prep Date.....: 04/26/99 Analysis Date...: 04/29/99
Prep Batch #....: 9116341
Dilution Factor: 1.02 Method.....: SW846 8270C

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acenaphthene	ND	10	ug/L
Acenaphthylene	ND	10	ug/L
Acetophenone	ND	10	ug/L
4-Aminobiphenyl	ND	51	ug/L
Aniline	ND	10	ug/L
Anthracene	ND	10	ug/L
Benzidine	ND	100	ug/L
Benzo(b)fluoranthene	ND	10	ug/L
Benzo(k)fluoranthene	ND	10	ug/L
Benzoic acid	ND	51	ug/L
Benzo(ghi)perylene	ND	10	ug/L
Benzo(a)pyrene	ND	10	ug/L
Benzyl alcohol	ND	10	ug/L
bis(2-Chloroethoxy) methane	ND	10	ug/L
bis(2-Chloroethyl) - ether	ND	10	ug/L
3-Methylphenol & 4-Methylphenol	ND	21	ug/L
bis(2-Ethylhexyl) phthalate	ND	10	ug/L
4-Bromophenyl phenyl ether	ND	10	ug/L
Butyl benzyl phthalate	ND	10	ug/L
4-Chloroaniline	ND	10	ug/L
4-Chloro-3-methylphenol	ND	10	ug/L
2-Chloronaphthalene	ND	10	ug/L
2-Chlorophenol	ND	10	ug/L
4-Chlorophenyl phenyl ether	ND	10	ug/L
Chrysene	ND	10	ug/L
Dibenz(a,j)acridine	ND	21	ug/L
Dibenzofuran	ND	10	ug/L
Di-n-butyl phthalate	ND	10	ug/L
1,2-Dichlorobenzene	ND	10	ug/L
1,3-Dichlorobenzene	ND	10	ug/L
1,4-Dichlorobenzene	ND	10	ug/L
3,3'-Dichlorobenzidine	ND	51	ug/L
2,4-Dichlorophenol	ND	10	ug/L

(Continued on next page)

6/2/99
SW

MONTGOMERY WATSON ANAL. TEST & CONS.
Client Sample ID: BFFLUENT
GC/MS Semivolatiles
Lot-Sample #...: G9D210227-001 Work Order #...: CTW4P102 Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS
2,6-Dichlorophenol	ND	10	ug/L <i>WJ</i>
Diethyl phthalate	ND	10	ug/L
7,12-Dimethylbenz(a)-anthracene	ND	21	ug/L
2,4-Dimethylphenol	ND	10	ug/L <i>WJ</i>
Dimethyl phthalate	ND	10	ug/L
Di-n-octyl phthalate	ND	10	ug/L
4,6-Dinitro-2-methylphenol	ND	51	ug/L <i>WJ</i>
2,4-Dinitrophenol	ND	51	ug/L <i>WJ</i>
2,4-Dinitrotoluene	ND	10	ug/L
2,6-Dinitrotoluene	ND	10	ug/L
Ethyl methanesulfonate	ND	10	ug/L
Fluoranthene	ND	10	ug/L
Fluorene	ND	10	ug/L
Hexachlorobenzene	ND	10	ug/L
Hexachlorobutadiene	ND	10	ug/L
Hexachlorocyclopentadiene	ND	51	ug/L
Hexachloroethane	ND	10	ug/L
Hexachloropropene	ND	10	ug/L
Indeno(1,2,3-cd)pyrene	ND	10	ug/L
Isophorone	ND	10	ug/L
2-Methylnaphthalene	ND	10	ug/L
2-Methylphenol	ND	10	ug/L <i>WJ</i>
Naphthalene	ND	10	ug/L
1-Naphthylamine	ND	10	ug/L <i>WJ</i>
2-Naphthylamine	ND	10	ug/L <i>WJ</i>
2-Nitroaniline	ND	51	ug/L
3-Nitroaniline	ND	51	ug/L <i>WJ</i> (20)
4-Nitroaniline	ND	51	ug/L
Nitrobenzene	ND	10	ug/L
2-Nitrophenol	ND	10	ug/L <i>WJ</i>
4-Nitrophenol	ND	51	ug/L <i>WJ</i>
N-Nitrosodi-n-butylamine	ND	10	ug/L
N-Nitrosodimethylamine	ND	10	ug/L
N-Nitrosodi-n-propylamine	ND	10	ug/L
N-Nitrosodiphenylamine	ND	10	ug/L
N-Nitrosopiperidine	ND	10	ug/L
Pentachlorobenzene	ND	10	ug/L
Pentachloronitrobenzene	ND	51	ug/L
Pentachlorophenol	ND	51	ug/L <i>WJ</i>

(Continued on next page)

6/2/99
(20)

MONTGOMERY WATSON ANAL. TEST & CONS.

Client Sample ID: EFFLUENT

GC/MS Semivolatiles

Lot-Sample #....: G9D210227-001 Work Order #....: CTW4P102 Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Phenacetin	ND	21	ug/L
Phenanthrene	ND	10	ug/L
Phenol	ND	10	ug/L <i>uJ</i>
2-Picoline	ND	21	ug/L
Pronamide	ND	21	ug/L
Pyrene	ND	10	ug/L
Safrole	ND	21	ug/L
1,2,4,5-Tetrachloro- benzene	ND	10	ug/L
2,3,4,6-Tetrachlorophenol	ND	51	ug/L
1,2,4-Trichlorobenzene	ND	10	ug/L
2,4,5-Trichlorophenol	ND	10	ug/L <i>uJ</i>
2,4,6-Trichlorophenol	ND	10	ug/L <i>uJ</i>
a,a-Dimethylphenethyl- amine	ND	51	ug/L
Azobenzene	ND	10	ug/L
2,2'-oxybis(1-Chloropropane)	ND	10	ug/L
Isosafrole	ND	21	ug/L
1-Chloronaphthalene	ND	10	ug/L
Dibenz(a,h)anthracene	ND	10	ug/L
Benzo(a)anthracene	ND	10	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
2-Chlorophenol-d4	51	(20 - 130)
1,2-Dichlorobenzene-d4	28	(20 - 130)
2-Fluorobiphenyl	29 *	(33 - 111)
2-Fluorophenol	36	(10 - 74)
Nitrobenzene-d5	50	(34 - 103)
Phenol-d5	25	(10 - 54)
Terphenyl-d14	59	(30 - 134)
2,4,6-Tribromophenol	60	(18 - 140)

6/2/99 *su*

NOTE(S) :

* Surrogate recovery is outside stated control limits.



Method SW8270 - Selected Ion Monitoring
Method SIM

Client Name: Quanterra, Incorporated - West Sacramento
Client ID: EFFLUENT
LAB ID: 063715-0001-SA
Matrix: AQUEOUS
Authorized: 26 APR 99

Sampled: 20 APR 99
Prepared: 27 APR 99

Received: 26 APR 99
Analyzed: 27 APR 99 16:43

Dilution Factor: 1.0

Instrument: GC/MS

Parameter	Wet Weight Result	Units	Detection Limit	Pquant	Qualifier
Pentachlorophenol	ND	ng/L	100	34	UJ

Surrogate	Recovery	Acceptable Range
2,4,6-Tribromophenol	19 %	50 - 150 I

4/27/99 (signature)

Note I = Surrogate recovery outside of standard recovery limits due to matrix interference

ND = Not Detected

Reported By: Timothy S. Holland

Approved By: Tom Austin

The cover letter is an integral part of this report.
Rev 230787

000006



MONTGOMERY WATSON ANAL. TEST & CONS.

Client Sample ID: EFFLUENT

TOTAL Metals

Lot-Sample #...: G9D210227-001

Matrix.....: WATER

Date Sampled...: 04/20/99

Date Received...: 04/21/99

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #...:	9120184					
Arsenic	0.090	0.010	mg/L	SW846 6010B	04/29-04/30/99	CTW4P107
Beryllium	ND	0.0050	mg/L	SW846 6010B	04/29-04/30/99	CTW4P108
Cadmium	ND	0.0050	mg/L	SW846 6010B	04/29-04/30/99	CTW4P109
Manganese	0.0081 B	0.015	mg/L	SW846 6010B	04/29-04/30/99	CTW4P10A
Selenium	0.0034 B	0.0050	mg/L	SW846 6010B	04/29-04/30/99	CTW4P10C
Thallium	ND	0.010	mg/L	SW846 6010B	04/29-04/30/99	CTW4P10D
Zinc	0.017 B	0.020	mg/L	SW846 6010B	04/29-04/30/99	CTW4P10E

Prep Batch #...: 9130246

Mercury	0.00017 B	0.00020	mg/L	MCAWW 245.1	05/10-05/11/99	CTW4P103
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NOTE(S):

B Estimated result. Result is less than RL.

CLS Labs

Analysis Report: Biochemical Oxygen Demand (Total), EPA Mtd. 405.1

Client: Quanterra Environmental
Services
880 Riverside Parkway
West Sacramento, CA 95605

Project No.:
Contact: Jon Gildersleeve
Phone: (916) 374-4334

Project:

Date Sampled: 04/20/99
Date Received: 04/21/99
Date Prepared: 04/22/99
Date Analyzed: 04/27/99
Date Reported: 04/29/99

Lab Contact: James Liang
Lab ID No.: R1527
Job No.: 821527
COC Log No.: 41416
Batch No.:
Instrument ID: NONE
Analyst ID: JOHNNH
Matrix: WATER

ANALYTICAL RESULTS

Lab / Client ID Analyte	Code	Results (mg/L)	Rep. Limit (mg/L)	Dilution (factor)
1A / Effluent Biochemical Oxygen Demand	N/A	20	3.0	1.0

ND = Not detected at or above indicated Reporting Limit



MONTGOMERY WATSON ANAL.TEST & CONS.

Client Sample ID: EFFLUENT

General Chemistry

Lot-Sample #....: G9D210227-001
Date Sampled...: 04/20/99

Work Order #....: CTW4P
Date Received...: 04/21/99

Matrix.....: WATER

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
pH	9.5	0.10	--	MCAWW 150.1	04/21/99	9111387

Dilution Factor: 1

Non-Filterable Solid ND
(Residue)

5.0 mg/L

MCAWW 160.2

04/22/99

9113348

Dilution Factor: 1



MONTGOMERY WATSON ANAL. TEST & CONS.

Client Sample ID: EFFLUENT DUP

TOTAL Metals

Lot-Sample #....: G9E260122-001

Matrix.....: WATER

Date Sampled....: 04/20/99

Date Received...: 04/21/99

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #....: 9147299						
Arsenic	0.089	0.010	mg/L	SW846 6010B	05/27-05/28/99	CW8A8101



MONTGOMERY WATSON ANAL. TEST & CONS.

Client Sample ID: EFFLUENT

GC/MS Volatiles

Lot-Sample #....: G9E250166-001 Work Order #....: CW7CW101 Matrix.....: WATER
Date Sampled....: 05/24/99 Date Received...: 05/25/99
Prep Date.....: 06/02/99 Analysis Date...: 06/02/99
Prep Batch #....: 9155401
Dilution Factor: 10 Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Dichlorodifluoromethane (Freon 12)	ND Q	10	ug/L
Trichlorofluoromethane (Freon 11)	ND	10	ug/L
Chloromethane	ND	10	ug/L
Vinyl chloride	ND	10	ug/L
Bromomethane	ND	10	ug/L
Chloroethane	7.5 J	10	ug/L
1,1-Dichloroethene	ND	10	ug/L
Methylene chloride	8.5 J	10	ug/L
trans-1,2-Dichloroethene	ND	10	ug/L
1,1-Dichloroethane	ND	10	ug/L
2,2-Dichloropropane	ND	10	ug/L
Bromochloromethane	ND	10	ug/L
Chloroform	ND	10	ug/L
1,1,1-Trichloroethane	ND	10	ug/L
Carbon tetrachloride	ND	10	ug/L
1,1-Dichloropropene	ND	10	ug/L
Benzene	370	10	ug/L
1,2-Dichloroethane	ND	10	ug/L
Trichloroethene	ND	10	ug/L
1,2-Dichloropropane	ND	10	ug/L
Dibromomethane	ND	10	ug/L
Bromodichloromethane	ND	10	ug/L
Toluene	6.6 J	10	ug/L
1,1,2-Trichloroethane	ND	10	ug/L
Tetrachloroethene	ND	10	ug/L
1,3-Dichloropropane	ND	10	ug/L
Dibromochloromethane	ND	10	ug/L
1,2-Dibromoethane (EDB)	ND	20	ug/L
Chlorobenzene	ND	10	ug/L
1,1,1,2-Tetrachloroethane	ND	10	ug/L
Ethylbenzene	ND	10	ug/L
m-Xylene & p-Xylene	5.0 J	10	ug/L
o-Xylene	2.9 J	10	ug/L
Styrene	ND	10	ug/L
Bromoform	ND	10	ug/L
Isopropylbenzene	ND	10	ug/L
Bromobenzene	ND	10	ug/L

(Continued on next page)



MONTGOMERY WATSON ANAL. TEST & CONS.

Client Sample ID: EFFLUENT

GC/MS Volatiles

Lot-Sample #....: G9E250166-001 Work Order #....: CW7CW101 Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS
1,1,2,2-Tetrachloroethane	ND	10	ug/L
1,2,3-Trichloropropane	ND	10	ug/L
n-Propylbenzene	ND	10	ug/L
2-Chlorotoluene	ND	10	ug/L
1,3,5-Trimethylbenzene	ND	10	ug/L
1,2,4-Trimethylbenzene	ND	10	ug/L
sec-Butylbenzene	ND	10	ug/L
1,3-Dichlorobenzene	ND	10	ug/L
p-Isopropyltoluene	ND	10	ug/L
1,4-Dichlorobenzene	ND	10	ug/L
1,2-Dichlorobenzene	ND	10	ug/L
n-Butylbenzene	ND	10	ug/L
1,2-Dibromo-3- chloropropane (DBCP)	ND	20	ug/L
1,2,4-Trichlorobenzene	ND	10	ug/L
Hexachlorobutadiene	ND	10	ug/L
Naphthalene	ND	10	ug/L
1,2,3-Trichlorobenzene	ND	10	ug/L
cis-1,2-Dichloroethene	4.4 J	10	ug/L
Acetone	72 B	50	ug/L
2-Butanone (MEK)	ND	50	ug/L
4-Methyl-2-pentanone (MIBK)	ND	50	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
4-Bromofluorobenzene	98	(70 - 130)
1,2-Dichloroethane-d4	103	(70 - 130)
Toluene-d8	99	(70 - 130)

NOTE (S) :

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.

J Estimated result. Result is less than RL.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.



MONTGOMERY WATSON ANAL. TEST & CONS.

Client Sample ID: EFFLUENT

GC/MS Semivolatiles

Lot-Sample #....: G9E250166-001 Work Order #....: CW7CW102 Matrix.....: WATER
Date Sampled....: 05/24/99 Date Received...: 05/25/99
Prep Date.....: 05/27/99 Analysis Date...: 06/07/99
Prep Batch #....: 9147392
Dilution Factor: 3.9 Method.....: SW846 8270C

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Acenaphthene	ND Q	39	ug/L
Acenaphthylene	ND	39	ug/L
Acetophenone	ND	39	ug/L
4-Aminobiphenyl	ND	200	ug/L
Aniline	ND	39	ug/L
Anthracene	ND	39	ug/L
Benzidine	ND	390	ug/L
Benzo(b)fluoranthene	ND	39	ug/L
Benzo(k)fluoranthene	ND	39	ug/L
Benzoic acid	ND	200	ug/L
Benzo(ghi)perylene	ND	39	ug/L
Benzo(a)pyrene	ND	39	ug/L
Benzyl alcohol	ND	39	ug/L
bis(2-Chloroethoxy) methane	ND	39	ug/L
bis(2-Chloroethyl)- ether	ND	39	ug/L
3-Methylphenol & 4-Methylphenol	ND	78	ug/L
bis(2-Ethylhexyl) phthalate	ND	39	ug/L
4-Bromophenyl phenyl ether	ND	39	ug/L
Butyl benzyl phthalate	ND	39	ug/L
4-Chloroaniline	ND	39	ug/L
4-Chloro-3-methylphenol	ND	39	ug/L
2-Chloronaphthalene	ND	39	ug/L
2-Chlorophenol	ND	39	ug/L
4-Chlorophenyl phenyl ether	ND	39	ug/L
Chrysene	ND	39	ug/L
Dibenz(a,j)acridine	ND	78	ug/L
Dibenzofuran	ND	39	ug/L
Di-n-butyl phthalate	ND	39	ug/L
1,2-Dichlorobenzene	ND	39	ug/L
1,3-Dichlorobenzene	ND	39	ug/L
1,4-Dichlorobenzene	ND	39	ug/L
3,3'-Dichlorobenzidine	ND	200	ug/L
2,4-Dichlorophenol	ND	39	ug/L

(Continued on next page)



MONTGOMERY WATSON ANAL. TEST & CONS.

Client Sample ID: EFFLUENT

GC/MS Semivolatiles

Lot-Sample #....: G9E250166-001 Work Order #....: CW7CW102 Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS
2,6-Dichlorophenol	ND	39	ug/L
Diethyl phthalate	ND	39	ug/L
7,12-Dimethylbenz(a)- anthracene	ND	78	ug/L
2,4-Dimethylphenol	ND	39	ug/L
Dimethyl phthalate	ND	39	ug/L
Di-n-octyl phthalate	ND	39	ug/L
4,6-Dinitro- 2-methylphenol	ND	200	ug/L
2,4-Dinitrophenol	ND	200	ug/L
2,4-Dinitrotoluene	ND	39	ug/L
2,6-Dinitrotoluene	ND	39	ug/L
Ethyl methanesulfonate	ND	39	ug/L
Fluoranthene	ND	39	ug/L
Fluorene	ND	39	ug/L
Hexachlorobenzene	ND	39	ug/L
Hexachlorobutadiene	ND	39	ug/L
Hexachlorocyclopenta- diene	ND	200	ug/L
Hexachloroethane	ND	39	ug/L
Hexachloropropene	ND	39	ug/L
Indeno(1,2,3-cd)pyrene	ND	39	ug/L
Isophorone	ND	39	ug/L
2-Methylnaphthalene	ND	39	ug/L
2-Methylphenol	ND	39	ug/L
Naphthalene	ND	39	ug/L
1-Naphthylamine	ND	39	ug/L
2-Naphthylamine	ND	39	ug/L
2-Nitroaniline	ND	200	ug/L
3-Nitroaniline	ND	200	ug/L
4-Nitroaniline	ND	200	ug/L
Nitrobenzene	ND	39	ug/L
2-Nitrophenol	ND	39	ug/L
4-Nitrophenol	ND	200	ug/L
N-Nitrosodi-n-butylamine	ND	39	ug/L
N-Nitrosodimethylamine	ND	39	ug/L
N-Nitrosodi-n-propyl- amine	ND	39	ug/L
N-Nitrosodiphenylamine	ND	39	ug/L
N-Nitrosopiperidine	ND	39	ug/L
Pentachlorobenzene	ND	39	ug/L
Pentachloronitrobenzene	ND	200	ug/L
Pentachlorophenol	ND	200	ug/L

(Continued on next page)

MONTGOMERY WATSON ANAL. TEST & CONS.

Client Sample ID: EFFLUENT

GC/MS Semivolatiles

Lot-Sample #....: G9E250166-001 Work Order #....: CW7CW102 Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Phenacetin	ND	78	ug/L
Phenanthrene	ND	39	ug/L
Phenol	ND	39	ug/L
2-Picoline	ND	78	ug/L
Pronamide	ND	78	ug/L
Pyrene	ND	39	ug/L
Safrole	ND	78	ug/L
1,2,4,5-Tetrachloro- benzene	ND	39	ug/L
2,3,4,6-Tetrachlorophenol	ND	200	ug/L
1,2,4-Trichlorobenzene	ND	39	ug/L
2,4,5-Trichlorophenol	ND	39	ug/L
2,4,6-Trichlorophenol	ND	39	ug/L
a,a-Dimethylphenethyl- amine	ND	200	ug/L
Azobenzene	ND	39	ug/L
2,2'-oxybis(1-Chloropropane)	320	39	ug/L
Isosafrole	ND	78	ug/L
1-Chloronaphthalene	ND	39	ug/L
Dibenz(a,h)anthracene	ND	39	ug/L
Benzo(a)anthracene	ND	39	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
2-Chlorophenol-d4	73	(20 - 130)
1,2-Dichlorobenzene-d4	70	(20 - 130)
2-Fluorobiphenyl	71	(33 - 111)
2-Fluorophenol	48	(10 - 74)
Nitrobenzene-d5	74	(34 - 103)
Phenol-d5	33	(10 - 54)
Terphenyl-d14	67	(30 - 134)
2,4,6-Tribromophenol	70	(18 - 140)

NOTE(S) :

Q Elevated reporting limit. The reporting limit is elevated due to high analyte levels.



MONTGOMERY WATSON ANAL. TEST & CONS.

Client Sample ID: EFFLUENT

TOTAL Metals

Lot-Sample #....: G9E250166-001

Matrix.....: WATER

Date Sampled....: 05/24/99

Date Received...: 05/25/99

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
Prep Batch #....: 9147299						
Arsenic	0.0055 B	0.010	mg/L	SW846 6010B	05/27-05/28/99	CW7CW107
Beryllium	ND	0.0050	mg/L	SW846 6010B	05/27-05/28/99	CW7CW108
Cadmium	ND	0.0050	mg/L	SW846 6010B	05/27-05/28/99	CW7CW109
Manganese	0.30	0.015	mg/L	SW846 6010B	05/27-05/28/99	CW7CW10A
Selenium	ND	0.0050	mg/L	SW846 6010B	05/27-05/28/99	CW7CW10C
Thallium	0.0032 B	0.010	mg/L	SW846 6010B	05/27-05/28/99	CW7CW10D
Zinc	0.0066 B	0.020	mg/L	SW846 6010B	05/27-05/28/99	CW7CW10E

Prep Batch #....: 9158257

Mercury	ND	0.00020	mg/L	MCAWW 245.1	06/07/99	CW7CW103
---------	----	---------	------	-------------	----------	----------

NOTE(S):

B Estimated result. Result is less than RL.



MONTGOMERY WATSON ANAL. TEST & CONS.

Client Sample ID: EFFLUENT

General Chemistry

Lot-Sample #...: G9E250166-001
Date Sampled...: 05/24/99

Work Order #...: CW7CW
Date Received...: 05/25/99

Matrix.....: WATER

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
pH	7.0	0.10	--	MCAWW 150.1	05/25/99	9145317

Dilution Factor: 1

Non-Filterable Solid ND
(Residue)

5.0 mg/L

MCAWW 160.2

05/27/99

9147379

Dilution Factor: 1



Method SW8270 - Selected Ion Monitoring
Method SIM

Client Name: Quanterra, Incorporated - West Sacramento

Client ID: G9E250166-1

LAB ID: 063777-0001-SA

Matrix: AQUEOUS

Authorized: 26 MAY 99

Sampled: 24 MAY 99

Prepared: 28 MAY 99

Received: 26 MAY 99

Analyzed: 03 JUN 99 14:30

Dilution Factor: 1.1

Parameter	Wet Weight Result	Units	Reporting Limit	Qualifier
Pentachlorophenol	ND	ng/L	110	

Surrogate	Recovery	Acceptable Range
2,4,6-Tribromophenol	89 %	29 - 178

ND = Not Detected

Reported By: Timothy S. Holland

Approved By: Tom Austin

The cover letter is an integral part of this report.

Rev 230787

000000

CLS Labs

Analysis Report: Biochemical Oxygen Demand (Total), EPA Mtd. 405.1

Client: Quanterra Environmental
Services
880 Riverside Parkway
West Sacramento, CA 95605

Project No.:
Contact: Jon Gildersleeve
Phone: (916)374-4381

Project:

Date Sampled: 05/25/99
Date Received: 05/25/99
Date Prepared: 05/25/99
Date Analyzed: 05/30/99
Date Reported: 06/02/99

Lab Contact: James Liang
Lab ID No.: R2204
Job No.: 822204
COC Log No.: 41446
Batch No.:
Instrument ID: NONE
Analyst ID: JOHNE
Matrix: WATER

ANALYTICAL RESULTS

Lab / Client ID Analyte	Code	Results (mg/L)	Rep. Limit (mg/L)	Dilution (factor)
1A / G9E250166-1 Biochemical Oxygen Demand	N/A	3.2	3.0	1.0

ND = Not detected at or above indicated Reporting Limit

FORM 1
PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EFFLUENT

Lab Name: COMPUCHEM

Contract: 501244

Lab Code: COMPU

Case No.: 34442

SAS No.:

SDG No.: 00001

Matrix: (soil/water) WATER

Lab Sample ID: 948878

Sample wt/vol: 990.0 (g/mL) ML

Lab File ID: _____

% Moisture: _____ decanted: (Y/N) _____

Date Received: 06/30/99

Extraction: (SepF/Cont/Sonc) SEPF

Date Extracted: 07/03/99

Concentrated Extract Volume: 5000 (uL)

Date Analyzed: 07/08/99

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: _____

Sulfur Cleanup: (Y/N) N

CAS NO.

COMPOUND

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

Q

12674-11-2-----Aroclor-1016	0.50	U
11104-28-2-----Aroclor-1221	1.0	U
11141-16-5-----Aroclor-1232	0.50	U
53469-21-9-----Aroclor-1242	0.50	U
12672-29-6-----Aroclor-1248	0.50	U
11097-69-1-----Aroclor-1254	0.50	U
11096-82-5-----Aroclor-1260	0.50	U

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

EFFLUENT

Lab Name: COMPUCHEM _____ Contract: SW-846 _____

Lab Code: COMPU_ Case No.: 34442_ SAS No.: _____ SDG No.: 00001_

Matrix (soil/water): WATER

Lab Sample ID: 948878

Level (low/med): LOW_

Date Received: 06/30/99

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L_

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	77.5	B		P
7440-36-0	Antimony	1.8	U		P
7440-38-2	Arsenic	2.0	U		P
7440-39-3	Barium	82.1			P
7440-41-7	Beryllium	0.10	U		P
7440-43-9	Cadmium	1.00	B		P
7440-70-2	Calcium	92400			P
7440-47-3	Chromium	1.3	B		P
7440-48-4	Cobalt	0.90	B		P
7440-50-8	Copper	6.3			P
7439-89-6	Iron	887			P
7439-92-1	Lead	1.0	U		P
7439-95-4	Magnesium	25400			P
7439-96-5	Manganese	121			P
7439-97-6	Mercury	0.02	U		CV
7440-02-0	Nickel	4.3	B		P
7440-09-7	Potassium	11800		E	P
7782-49-2	Selenium	3.1	U	N	P
7440-22-4	Silver	0.30	U		P
7440-23-5	Sodium	91300			P
7440-28-0	Thallium	4.1	U		P
7440-62-2	Vanadium	0.60	U		P
7440-66-6	Zinc	15.3	B		P

Color Before: COLORLESS Clarity Before: CLEAR_ Texture: _____

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

Duplicate_ (EFFLUENTD) _____

Data Analysis Technologies, Inc.

6385 Shier Rings Rd.

Dublin, OH 43016

Sample Analysis Certificate

Client: CompuChem

Date Sampled: 6/29/99

Client Sample ID: Effluent

Date Received: 7/12/99

Sample Volume: 1000 mls

Lab Sample ID: 0799027-1

Extract Volume: 1.0 ml

Matrix: Aqueous

Target Analyte	Result	Units	DL	Prep Date	Analysis Date
Pentachlorophenol	0.29	ug/L	1.0	7/3/99(CompuChem)	7/17/99

Surrogate:	Amount Spiked	Amount Found	Units	%Rec.
2,4,6-Tribromophenol	393	330	ug	84%

000006

TestAmerica

INCORPORATED

FINAL REPORT OF ANALYSES

COMPUCHEM
501 MADISON AVE.
CARY, NC 27513-
Attn: MS DIANE BYRD

PROJECT NAME: ACS, 99-0499
REPORT DATE: 07/08/99

SAMPLE NUMBER- 42553 SAMPLE ID- ACS EFFLUENT
DATE SAMPLED- 06/29/99
DATE RECEIVED- 07/01/99 SAMPLER- NOT SPECIFIED
TIME RECEIVED- 1330 DELIVERED BY- JEFF NEALY

SAMPLE MATRIX- WW
TIME SAMPLED- 1400
RECEIVED BY- PSH

Page 1 of 1

ANALYSIS	METHOD	ANALYSIS DATE	BY	RESULT UNITS	QUAL DET. CODE LIMIT
BIOCHEMICAL OXYGEN DEMAND	SM5210B	07/01/99	KSW	92.0 MG/L	2.0

LABORATORY DIRECTOR

Par Hester

NC DENR DWQ # 37, NC DENR DW #37716, SC DEHC # 99037

PH IN WATER ANALYSIS

SUMMARY REPORT

ITEM NO.	SAMPLE IDENTIFIER	COMPUCHEM NUMBER	RESULT (Standard pH units)	REPORTING LIMIT (Standard pH units)
1.	EFFLUENT	948878	7.2	N/A

Reviewed by/ID#: Joe Brail 12381 Date: 7/21/99

TOTAL SUSPENDED SOLIDS ANALYSIS

SUMMARY REPORT

ITEM NO.	SAMPLE IDENTIFIER	COMPUCHEM NUMBER	RESULT (mg/L)	REPORTING LIMIT (mg/L)
1.	EFFLUENT	948878	9	4

Reviewed by/ID#: Joe Basich / 2381 Date: 7/21/99

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

EFFLUENT

Lab Name: COMPUCHEM

Contract: 501244

Lab Code: COMPU

Case No.: 34442

SAS No.:

SDG No.: 00001

Matrix: (soil/water) WATER

Lab Sample ID: 948878

Sample wt/vol: 25.0 (g/mL) ML

Lab File ID: CN048878A56.D

Level: (low/med) LOW

Date Received: 06/30/99

% Moisture: not dec. _____

Date Analyzed: 07/15/99

GC Column: EQUITY624 ID: 0.53 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
---------	----------	--	---

74-83-9-----	Bromomethane	0.5	U
75-01-4-----	Vinyl Chloride	0.5	U
75-00-3-----	Chloroethane	0.5	U
75-09-2-----	Methylene Chloride	0.5	U
75-35-4-----	1,1-Dichloroethene	0.5	U
75-34-3-----	1,1-Dichloroethane	0.5	U
67-66-3-----	Chloroform	0.5	U
107-06-2-----	1,2-Dichloroethane	0.5	U
71-55-6-----	1,1,1-Trichloroethane	0.5	U
56-23-5-----	Carbon Tetrachloride	0.5	U
75-27-4-----	Bromodichloromethane	0.5	U
10061-01-5-----	cis-1,3-Dichloropropene	0.5	U
79-01-6-----	Trichloroethene	0.5	U
124-48-1-----	Dibromochloromethane	0.5	U
79-00-5-----	1,1,2-Trichloroethane	0.5	U
71-43-2-----	Benzene	0.3	J
10061-02-6-----	trans-1,3-Dichloropropene	0.5	U
75-25-2-----	Bromoform	0.5	U
127-18-4-----	Tetrachloroethene	0.5	U
79-34-5-----	1,1,2,2-Tetrachloroethane	0.5	U
108-88-3-----	Toluene	0.5	U
108-90-7-----	Chlorobenzene	0.5	U
100-41-4-----	Ethylbenzene	0.5	U
100-42-5-----	Styrene	0.5	U
78-87-5-----	1,2-Dichloropropane	0.5	U
74-87-3-----	Chloromethane	0.5	U
75-15-0-----	Carbon disulfide	1	
67-64-1-----	Acetone	7	B
108-10-1-----	4-Methyl-2-pentanone	2	U
591-78-6-----	2-hexanone	2	U
78-93-3-----	2-butanone	1	J
156-60-5-----	trans-1,2-Dichloroethene	0.5	U
156-59-2-----	cis-1,2-Dichloroethene	0.5	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

EFFLUENT

Lab Name: COMPUCHEM

Contract: 501244

Lab Code: COMPU

Case No.: 34442

SAS No.:

SDG No.: 00001

Matrix: (soil/water) WATER

Lab Sample ID: 948878

Sample wt/vol: 25.0 (g/mL) ML

Lab File ID: CN048878A56.D

Level: (low/med) LOW

Date Received: 06/30/99

% Moisture: not dec. _____

Date Analyzed: 07/15/99

GC Column: EQUITY624 ID: 0.53 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

CAS NO.

COMPOUND

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

Q

1330-20-7-----Xylene (total) _____

0.5 U

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EFFLUENT

Lab Name: COMPUCHEM

Contract: 501244

Lab Code: COMPU

Case No.: 34442

SDG No.: 00001

Matrix: (soil/water) WATER

Lab Sample ID: 948878

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: GH048878A68

Level: (low/med) LOW

Date Received: 06/30/99

% Moisture: _____ decanted: (Y/N) _____

Date Extracted: 07/03/99

Concentrated Extract Volume: 1000 (uL)

Date Analyzed: 07/08/99

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
---------	----------	--	---

108-95-2-----	Phenol	10	U
111-44-4-----	Bis(2-chloroethyl) ether	10	U
95-57-8-----	2-Chlorophenol	10	U
541-73-1-----	1,3-Dichlorobenzene	10	U
106-46-7-----	1,4-Dichlorobenzene	10	U
95-50-1-----	1,2-Dichlorobenzene	10	U
95-48-7-----	2-Methylphenol	10	U
108-60-1-----	bis(2-Chloroisopropyl) ether	10	U
106-44-5-----	4-Methylphenol	10	U
621-64-7-----	N-Nitroso-di-N-propylamine	10	U
67-72-1-----	Hexachloroethane	10	U
98-95-3-----	Nitrobenzene	10	U
78-59-1-----	Isophorone	10	U
88-75-5-----	2-Nitrophenol	10	U
105-67-9-----	2,4-Dimethylphenol	10	U
111-91-1-----	Bis(2-chloroethoxy) methane	10	U
120-83-2-----	2,4-Dichlorophenol	10	U
120-82-1-----	1,2,4-Trichlorobenzene	10	U
91-20-3-----	Naphthalene	10	U
106-47-8-----	4-Chloroaniline	10	U
87-68-3-----	Hexachlorobutadiene	10	U
59-50-7-----	4-Chloro-3-methylphenol	10	U
91-57-6-----	2-Methylnaphthalene	10	U
77-47-4-----	Hexachlorocyclopentadiene	10	U
88-06-2-----	2,4,6-Trichlorophenol	10	U
95-95-4-----	2,4,5-Trichlorophenol	10	U
91-58-7-----	2-Chloronaphthalene	10	U
88-74-4-----	2-Nitroaniline	20	U
131-11-3-----	Dimethylphthalate	10	U
606-20-2-----	2,6-Dinitrotoluene	10	U
208-96-8-----	Acenaphthylene	10	U
99-09-2-----	3-Nitroaniline	20	U
83-32-9-----	Acenaphthene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

EFFLUENT

Lab Name: COMPUCHEM

Contract: 501244

Lab Code: COMPU

Case No.: 34442

SDG No.: 00001

Matrix: (soil/water) WATER

Lab Sample ID: 948878

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: GH048878A68

Level: (low/med) LOW

Date Received: 06/30/99

% Moisture: _____ decanted: (Y/N) _____

Date Extracted: 07/03/99

Concentrated Extract Volume: 1000 (uL)

Date Analyzed: 07/08/99

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
---------	----------	--	---

51-28-5-----	2,4-Dinitrophenol	20	U
100-02-7-----	4-Nitrophenol	20	U
121-14-2-----	2,4-Dinitrotoluene	10	U
132-64-9-----	Dibenzofuran	10	U
84-66-2-----	Diethylphthalate	10	U
7005-72-3-----	4-Chlorophenyl-phenylether	10	U
86-73-7-----	Fluorene	10	U
100-01-6-----	4-Nitroaniline	20	U
534-52-1-----	4,6-Dinitro-2-methylphenol	20	U
86-30-6-----	N-Nitrosodiphenylamine (1)	10	U
101-55-3-----	4-Bromophenyl-phenylether	10	U
118-74-1-----	Hexachlorobenzene	10	U
87-86-5-----	Pentachlorophenol	20	U
85-01-8-----	Phenanthrene	10	U
120-12-7-----	Anthracene	10	U
86-74-8-----	Carbazole	10	U
84-74-2-----	Di-n-butylphthalate	10	U
206-44-0-----	Fluoranthene	10	U
129-00-0-----	Pyrene	10	U
85-68-7-----	Butylbenzylphthalate	10	U
91-94-1-----	3,3'-Dichlorobenzidine	10	U
117-81-7-----	bis(2-ethylhexyl) Phthalate	10	U
56-55-3-----	Benzo(a) anthracene	10	U
218-01-9-----	Chrysene	10	U
117-84-0-----	Di-n-octylphthalate	10	U
205-99-2-----	Benzo(b) fluoranthene	10	U
207-08-9-----	Benzo(k) fluoranthene	10	U
50-32-8-----	Benzo(a) pyrene	10	U
193-39-5-----	Indeno(1,2,3-c,d) pyrene	10	U
53-70-3-----	Dibenzo(a,h) anthracene	10	U
191-24-2-----	Benzo(g,h,i) perylene	10	U

(1) - Cannot be separated from Diphenylamine

B



